ENCYCLOPEDIA
on Early Childhood
Development

Digital Play

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Introduction

Young children growing up in the 21st century are known to be active users of technologies. Technology use by young children has introduced a new concept into early childhood education and care - that of digital play.

Subject

The concept of digital play is related to the emergence of the digital age as a cultural context for young children's growth and development in the 21st century. Technically, the digital age commenced with the invention of the transistor in 1956.[1] The transistor enabled innovations in micro-processing. Micro-processors are the small chips that process and store information in digital form. Micro-processors are employed in many different technologies including those commonly accessed by young children (e.g., mobile devices and internet-enabled toys). Researchers now consider the use of such technologies by young children as 'domesticated'.[2] The domestication of technologies provides new opportunities for children's play. These opportunities facilitate children's interactions with digital technologies in a way that was not possible in previous generations prior to the digitization of information via micro-processing.

Problems

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The available literature on digital play expresses a common problem. That is how should digital play be defined for the digital age when definitions of play from the preceding industrial age have not yet been agreed upon? Multiple theories and perspectives (e.g., romantic, psychoanalytic, constructivist and socio-cultural) on play have been generated for many years.[3] These viewpoints have engendered specific debate regarding the exact nature and purpose of play. For example, why do children play? What is the relationship between play and learning? Is play universal or a culturally defined activity? Research in early childhood education typically defines play as a contested concept, and therefore in well-designed studies a stated theoretical perspective on play is usually provided.[4] Accordingly, play is frequently understood as open to interpretation. This openness now extends to a new body of work seeking to develop the concept of digital play.

Research

Early research into young children's technology use did not focus on the concept of digital play. Instead, research considered the influence of technology use on children's learning and developmental outcomes.[5] This research reached a peak in the 1990s and early 2000s as desktop and laptop computing became mainstream. The research was characterized by two main positions. Some researchers believed that technologies were inappropriate for young children because they displaced children's engagement with hands-on activities and real world experiences.[6] Others argued that technologies, such as robotics and the use of open-ended software facilitated young children's cognitive development and problem solving capacities.[7,8] This debate continued for some time, fading in emphasis following the advent of mobile internet-enabled touchscreen technologies (mostly notably the iPad in 2010).

These technologies released users from a reliance on the mouse and keyboard as input devices and proved particularly user friendly for very young children.[9] Stephen and Edwards[10] describe the influence of Alan Kay[11] in predicting a Dynamic Book as a learning resource for young children based on his reading of key early childhood thinkers, including Montessori, Piaget, Bruner and Vygotsky as a fore-runner to the range of touchscreen technologies enjoyed by children today. Technological mobility also informed new social and communication practices such that children were typically surrounded by adult users of technologies, and themselves had ready access to technological devices at any time or place for play.[12,13] Technology use, and therefore opportunities for digital play were no longer restricted to the home or early learning setting.[14,15] International research showed a rapid increase in the number of children aged birth

to eight years using technologies on a daily basis.[16,17,18] This include a noted increase in young children's access to, and use of, online digital media.[19] With more and more children using technologies in their daily lives, scholarly papers and research in the field of early childhood education and care began to focus on the concept of digital play.[20]

Current research in early childhood education and care conceptualizes digital play in two main ways. The first of these attends to the theorization of digital play. Much of this work adopts variations of existing play scholarship and applies these to observations of children's play with technologies. Some of the earliest thinking was that of Johnson and Christie[21] who described digital play as a social and open-ended activity with technologies. Verenkina and Kervin[22] were amongst the first to define digital play with touchscreen technologies as a self-initiated and self-regulated activity using apps. Fleer[23] defined digital play as the application of Vygotsky's ideas regarding imagination to young children's engagements with technologies. Bird and Edwards[24] created a Digital Play Framework integrating Corrine Hutt's thinking regarding epistemic and ludic play with the Vygotskian idea of tool mediation. Marsh, Plowman, Yamada-Rice, Bishop and Scott[25] generated a typology of play following the thinking of Bob Hughes, while Arnott[26] developed a Digital Play System based on the ecological thinking of Bronfenbrenner.

The second direction in digital play research focuses on understanding the relationship between children's traditional play activities and their engagement with digital technologies. This research highlights the impossibility of separating children's traditional play from their engagement with technologies in the digital age. Marsh[27] commenced the discussion by noting a continuum of digital to non-digital play activities engaged by children. Plowman, McPake and Stephen[28] noted a blurring boundary between digital and traditional play activities by young children. O'Mara and Laidlaw[29] illustrated how digital and traditional role play was seamlessly enacted by children using analogue dolls and an iPad. Edwards[30] proposed the notion of web-mapping as means of understanding the integrative nature of traditional, technological and digital media activities for very young children. Other researchers highlight new forms of play activity by young children in which the direction of play from a technological to traditional direction and vice-versa can no longer be identified.[31]

Key Research Questions

A significant problem for the early childhood education and care sector is how parents, services and policy are likely to understand the concept of digital play in the digital age. This is an issue

because play is frequently promoted to parents as beneficial for children's learning. It is also typically used as a basis for curriculum provision in early childhood education and care settings internationally. However concerns regarding the displacement of physical activity, social interactions and sleep with digital activities means that adults are not always clear on how best to manage and provide for young children's digital play.[32,33] How, where and why young children participate in digital play is therefore raising new research questions. For example:

1. To what extent does digital play build young children's early science, technology, engineering, and mathematics (STEM) concepts and capabilities?
2. How should parents and educators balance digital play with young children's requirement for active, outdoor physical activity?
3. What does digital play look like in an early childhood education and care setting?
4. Does digital play differ across social, gendered, cultural and economic contexts according to young children's access to technologies?

Research Gaps

Digital play means that young children are active users of technologies and digital media content. The range of digital play activities afforded to young children growing up in the digital age also involves their online participation. Many toys are now internet-enabled and collect data about children's play and private lives.[34] Toddlers and preschoolers independently access online content through video-sharing channels.[35] The Internet of Things also extends to internet-enabled toys for children's play.[36] These activities can expose children to online risks broadly defined as content, conduct and contact based.[37] Increasingly, there are calls for digital citizenship education to commence in early childhood (e.g., Children's Commissioner for England;[38] NAEYC and the Fred Rogers Centre for Early Learning and Children's Media[39]). Digital citizenship education itself is a conflated concept involving variations of cyber-safety, information literacy, cyber-bullying, online security and management of digital reputation. Significant research gaps exist in identifying what very young children understand about digital play, technologies and the internet as the foundational knowledge base for their digital citizenship education (e.g., Edwards et al;[40]; Heider[41]). Further research is required to establish how young children's digital play can be facilitated in early learning settings to build their knowledge of technologies and the internet for effective digital citizenship.

Conclusion

Digital play is a new concept in early childhood education and care related to the emergence of the digital age. Young children today are growing up in a new cultural context in which the evolution of technologies (beginning with the invention of the transistor) has created new opportunities for play. Research is currently directed towards theorizing digital play and understanding the convergence of traditional play with technological activity as a form of digital play. These new understandings of play are required by the sector as parents, services and policy-makers increasingly engage with young children growing up with technologies as domesticated aspect of their lives.

Implications for Parents, Services and Policy

Digital play is not going to go away. Parents, services and policy cannot ignore that digital play is a facet of the digital age in which young children are growing up. Thinking about digital play has several implications for parents, service and policy. These are:

1. Promoting digital play as an opportunity for building concepts and skills about STEM
2. Building young children's capacity to moderate digital play with opportunities for active, physical outdoor activity
3. Fostering understandings of what digital play looks like in early childhood education settings
4. Ensuring young children have equal and equitable opportunities to participate in digital play
5. Developing age appropriate digital citizenship education for young children

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